Vapor Intrusion Interim Measures Quarterly Report No. 8

Chamberlain Manufacturing Corporation
Former Facility at
550 Esther Street
Waterloo Iowa
EPA Docket Nos.
RCRA-07-2010-002
CERCLA-07-2010-0005

July 31, 2013
Terracon Project No. 07107020

Prepared for:
Chamberlain Manufacturing Corporation
Elmhurst, Illinois

Prepared by:
Terracon Consultants, Inc.
Omaha, Nebraska

Terracon

July 31, 2013

United States Environmental Protection Agency
Region 7 - Air and Waste Management Division
11201 Renner Blvd
Lenexa, Kansas 66219

Attn: Mr. Bruce Morrison

Re: Vapor Intrusion Interim Measures Quarterly Report No. 8
Chamberlain Manufacturing Corporation
Former Facility at 550 Esther Street
Waterloo, Iowa
EPA Docket Nos. RCRA-07-2010-002 and CERCLA-07-2010-0005

Dear Mr. Morrison:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Vapor Intrusion Interim Measures (VIIM) Quarterly Report for activities conducted between April 1, 2013, and June 30, 2013, in conjunction with the site referenced above. The VIIM Quarterly Report presents a summary of activities related to the installation, operation, and monitoring of vapor mitigation systems in residential structures as requested by the EPA. This report also summarizes air analytical results that were collected during this period.

Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,

Terracon Consultants, Inc.

Michael E. Hagemeister, P.E.*
Senior Principal
**Licensed in NE*

David M. Svingen, P.E.
Senior Principal
Iowa No. 11802

STW/MEH/DMS:stw/leb

Distribution: Addressee (1 bound)

TABLE OF CONTENTS

ACRONYMS & ABBREVIATIONS

CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
City ..... City of Waterloo
COC ..... Chain of Custody
EPA ..... Environmental Protection Agency
Facility ..... Chamberlain Manufacturing facility
HASP ..... Health and Safety Plan
HVAC ..... Heating, Ventilating, and Air Conditioning
IAQ ..... Indoor Air Quality
NELAC ..... National Environmental Laboratory Accreditation Conference
PCE ..... Tetrachloroethene (or Perchloroethene)
PID ..... Photoionization Detector
ppm ..... parts per million
QA ..... Quality Assurance
QAM ..... Quality Assurance Manual
QAPP ..... Quality Assurance Project Plan
QC ..... Quality Control
RCRA ..... Resource Conservation and Recovery Act
RSL ..... Regional Screening Level
SOP ..... Standard Operating Procedure
SOW ..... Statement of Work
TCE ..... Trichloroethene
TestAmerica ..... TestAmerica, Inc.
TSOP ..... Terracon Standard Operating Procedure
UAO ..... Unilateral Administrative Order
USEPA ..... United States Environmental Protection Agency
VIC ..... Vapor Intrusion Characterization
VIIM ..... Vapor Intrusion Interim Measures
VMS ..... Vapor Mitigation System
VOC ..... Volatile Organic Compound

VAPOR INTRUSION INTERIM MEASURES
QUARTERLY REPORT NO. 8
CHAMBERLAIN MANUFACTURING CORPORATION
FORMER FACILITY AT
550 ESTHER STREET
WATERLOO, IOWA

Terracon Project No. 07107020
July 31, 2013

1.0 INTRODUCTION

Terracon has developed this VIIM Quarterly Report to identify interim remedial measures completed in residential structures in which vapor concentrations related to shallow groundwater contamination from the former Chamberlain Manufacturing Facility (Facility) exceed indoor air screening levels for the period of April 1, 2013, through June 30, 2013. This VIIM Quarterly Report is submitted in accordance with the requirements of the UAO, Docket Nos. RCRA 07-2010-002 and CERCLA 07-2010-005 dated April 20, 2010, and Task IA of the SOW attached to the UAO. Capitalized terms not defined herein have the definitions set for the in the UAO or the SOW.

This VIIM Quarterly Report also provides a summary of indoor analytical results that have been obtained from the residences sampled during the period from April 1, 2013, through June 30, 2013. The residences sampled this period have not previously required the installation of vapor mitigation based on concentrations observed at these properties or the property owner electing to continue semi-annual monitoring instead of the installation of a vapor mitigation system.

1.1 Site Conditions

The Facility is an irregularly shaped parcel containing approximately 22.8 acres and located at 550 Esther Street in Waterloo, Iowa. A Topographic Vicinity Map is included as Exhibit 1, Appendix A. A Site Diagram is included as Exhibit 2, Appendix A.

The Facility manufactured metal washer wringers and projectile metal parts from approximately 1919 until 1996 when it was sold to Atlas Warehouse L.C. for use as a storage facility. The Facility was subsequently abandoned and is currently vacant. The City of Waterloo (City) acquired the Facility from Atlas Warehouse L.C in 2005 in an effort to facilitate redevelopment and has demolished a significant portion of the Facility.

The Facility is zoned Heavy Industrial (M-2) by the City. The Facility is adjoined by park land to the north and south, single family residential housing to the west, and Virden Creek followed by a golf course to the east. Virden Creek is within approximately 100 feet of the Facility at its closest point. Gates Park adjoins the Facility to the north across Louise Street, to the east across Virden Creek, and to the south across the railroad tracks. Single family residences are located across East 4th Street to the west of the Facility. Single family residences are also located along the east side of East 4th between Anita and Louise Streets.

1.2 Previous Assessment Activities

Beginning in 2004, the City conducted an environmental assessment of the site using a USEPA Brownfields Grant. Results of assessment activities identified impacts to soil and groundwater at the site including a chlorinated solvent plume that extends offsite to the south and west. Site assessment activities were not completed due to funding restrictions of the Brownfields Grant program.

Subsequently, environmental assessment activities of onsite soil and groundwater conditions and the offsite chlorinated solvent plume were conducted by Chamberlain. The lateral extent of the chlorinated solvent plume extends south and west from the Facility into an area of residential development. The USEPA's preliminary evaluation identified the potential for vapor intrusion into residential structures based on the vapor intrusion to indoor air pathway resulting from the groundwater contaminant plume.

To further evaluate the vapor intrusion pathway, the USEPA conducted subslab vapor sampling of selected residences in November 2008. Due to problems with the sampling and analysis equipment, the sampling activities were repeated in April and May 2009. Subslab vapor samples were collected from ten homes located along and near East 4th Street and analyzed for VOCs. In addition, one indoor air sample was collected from one of the ten homes. The results of sampling activities identified PCE and TCE in excess of subslab vapor screening levels. The elevated concentrations were generally located within the 2200, 2300, and 2400 block of East 4th Street.

In accordance with the approved VIC Work Plan, Terracon initially conducted vapor intrusion characterization at 22 residences that responded with completed Sampling Request Forms and Access Agreements from both the property owner and current renter. Initial subslab, indoor air, and ambient air sampling was conducted between April 25, 2011, and May 3, 2011. Additional indoor air samples were collected from four residences on June 16, 2011, and from one residence on September 14, 2011. Based on the analytical results, the reported concentrations of indoor air samples in seven residences were greater than the applicable indoor air screening levels. Subslab and indoor air sample results were presented in the VIC Report dated July 5, 2011.

In accordance with the approved VIC Report, Terracon offered vapor sampling to 14 additional residences located on the west side of the 300 block of Boston Avenue and the east side of the 400 block of Boston Avenue. Terracon also reoffered vapor sampling to those residences that did not respond to previous submittals and contacted residences that requested sampling through the USEPA or that had previously authorized sampling, but could not be reached to schedule an appointment. Supplemental subslab, indoor air, and ambient air sampling was conducted at nine residences between December 12, and December 14, 2011. Analytical results for subslab samples collected from two residences exceeded subslab screening levels and as such, additional indoor air samples were collected at these locations on March 23, 2012. Analytical results for supplemental sampling activities were submitted to the USEPA on April 19, 2012. During the second quarter 2012, indoor air samples were collected at Residences 48 and 73 and were reported in Terracon's July 19, 2012, VIIM Quarterly Report No. 4.

Terracon's October 29, 2012, VIIM Quarterly Report No. 5 summarized analytical results of a routine air monitoring event that included eight homes and results of a routine annual interim mitigation system inspection. As indicated in the January 31, 2013, VIIM Quarterly Report No. 6, residence No. 73 opted for semiannual monitoring over a mitigation system due to reported concentrations of TCE that exceeded screening levels, but with an apparent downward trend.

Terracon's April 30, 2013, VIIM Quarterly Report No. 7 summarized the results of a routine air monitoring event that included six homes, Residences 20, 33, 38, 40, 47, and 60. The first semi-annual 2013 monitoring event was also to include air sampling of Residences 73 and 76. Air sampling of these homes was deferred with USEPA approval (email dated March 18, 2013). Sampling of these two homes was delayed to June 2013 because each experienced damage requiring extensive repair work. Residence No. 48 had also been scheduled for first semi-annual 2013 monitoring event but the tenant was unresponsive to Terracon's requests. The results of the first semi-annual 2013 monitoring event did not indicate screening levels that required installation of vapor mitigation systems.

1.3 Project Objectives

The objective of this VIIM Quarterly Report is to present the information required by Section 4.0 of the approved VIIM Work Plan dated October 14, 2010, revised on August 1, 2011, and amended July 19, 2011. This information includes system design "as-builts," information on the expected operational life of the system, a recommendation for the frequency for monitoring and maintaining the system, criteria for determining its effectiveness, a schedule for system replacement in whole or in part (as appropriate), the frequency of system inspection by the Respondent, the results of post-installation system monitoring and any approved deviations from the approved VIIM Work Plan.

2.0 SCOPE OF SERVICES

2.1 Mitigation Determination

During the 2nd quarter of 2013, indoor air samples were collected from two residences, Residences No. 73 and 76. These homes were sampled in June 2013 instead of during the routine first semi-annual event because each residence experienced damage requiring major renovation. Residence No. 73 previously reported that the home had a backed up sewer, requiring major clean-up. Residence No. 76 reported that a fire had occurred in the home and renovation efforts were underway.

Residence No. 73 had an exceedence for trichloroethene of the indoor air threshold, which is discussed in Section 6.0. Additional investigation of potential chemical artifacts from sewer clean-up efforts, possible building changes, and resampling is being proposed at this time. In terms of potential building changes, this home previously had a hole in the floor covered by an unsealed approximate six-inch steel plate. Prior to sealing this plate with caulking, the indoor TCE air results were above the threshold and following caulking the results were on a declining trend with results in the fall 2013 being below the TCE threshold level (the duplicate result was above the threshold level). As part of the proposed work, Terracon would interview the homeowner about changes made to the home as a result of the sewer leak, including a discussion on penetrations or holes in the floor etc. that may be allowing vapors to enter the home.

Residence No. 76 indoor air results were below applicable indoor air threshold levels. As such, vapor mitigation is not proposed at this residence.

2.2 Site Access Protocol

Residents were contacted at least 48 hours in advance of sampling to arrange a time and date for conducting the proposed activities.

3.0 PROCEDURES FOR SYSTEM DESIGN, INSTALLATION AND COMMISSIONING

Vapor mitigation systems were not designed, installed, commissioned or decommissioned during the 2nd calendar quarter of 2013.

4.0 COMPLETED SYSTEM INSTALLATIONS

Interim mitigation systems were previously offered to, accepted by, and installed at eight Residences. Interim mitigation systems were subsequently shut off at three Residences. Chamberlain understands that the USEPA and the tenants of homes with shutdown mitigation systems have discussed restarting these systems. Further it is understood by Chamberlain that they are not obligated to maintain these three systems if restarted since indoor air results have been below applicable threshold levels. System installations were not conducted during the 2nd calendar quarter of 2013.

5.0 COMPLETED SYSTEM INSPECTION AND REPAIR

In accordance with the approved VIIM Work Plan, system inspections are to occur on an annual basis following installation through the period of required operation. The purpose of the site inspection is to check each operating system for general condition using visual observation. The inspection includes checking for: proper operation of the blower, possible cracks or disconnections in visible piping, piping attachments, and checking manometer to confirm system vacuum. System inspections were last conducted in the 3rd quarter of 2012 and the results were reported in the October 29, 2012, VIIM Quarterly Report No. 5. The next scheduled system inspection and repair event will occur during the 3rd quarter of 2013.

6.0 INDOOR AIR MONITORING RESULTS

6.1 Sampling Activities

Indoor air sampling was conducted at Residences 73 and 76 on June 27 and 28, 2013. The residences sampled during this period do not have active mitigation systems. These residences were not sampled (with EPA-approved delay) as part of the first semi-annual 2013 air monitoring event. As previously stated, sampling of these homes were delayed due to repairs being made due to sewer backup damage (Residence No. 73) and fire damage (Residence No. 76). Residence No. 73 was added to the routine monitoring program per homeowner request over installation of a vapor mitigation system. Semiannual indoor air monitoring was conducted at Residence No. 76 in accordance with the approved VIC Report where sub-slab concentrations exceeded sub-slab screening levels, but indoor air concentrations were below indoor air screening levels.

Indoor air samples were collected using laboratory prepared 6-liter Summa canisters and flow controllers. The flow controllers were pre-set by the laboratory to collect samples over a 24-

hour period. Terracon requested that occupants close doors and windows and operate the HVAC system for the period beginning 24-hours prior to the start of sample collection to the end of sample collection.

Consistent with VIC activities and in accordance with the EPA approval letter dated January 6, 2011, indoor air sampling was conducted in the basement and in the lowest occupied living area of each residence. A finished basement is considered to be an occupied living space. Terracon attempted to position sample containers in the same general location used for previous indoor air sampling.

Terracon field personnel connected the flow controller to the Summa canister by removing the brass cap on the canister and tightening the stainless steel Swagelok fitting on the flow controller to the threads on the canister. A wrench was used to firmly tighten the fitting.

Once sample containers were positioned, pertinent information on the air sampling forms (i.e. project information, equipment identifiers, sample location, and start time) was entered and the forms were attached to the canisters. A Soil Vapor/Indoor Air Sampling Information Form indicating appropriate project and sample collection information was executed for each indoor air sample. A COC indicating the collection date and times for each sample was also executed and maintained throughout the sampling event.

To open the canister, the valve was rotated counter-clockwise at least one full turn or otherwise opened. After 24-hours from opening the canisters, Terracon personnel returned to the Residences, closed the valve on each canister and recorded the time and vacuum remaining in the Summa canister on the Terracon sampling forms and on the COC. The canisters and flow controllers were then transported to the laboratory.

Indoor air monitoring activities are summarized in Table 6-1.

Table 6-1 Semiannual Indoor Air Monitoring

Residence No.	Sample Date	Basement Sample	1st Floor Sample
73	06/27/13	X	---[1]
76 and blind duplicate	06/27/13	X	---[1]

[1] – Basement contains a finished family room; therefore, the basement is the lowest occupied level. Per the USEPA letter of January 6, 2011, sampling is not required on the first floor.

6.2 Air Monitoring Results

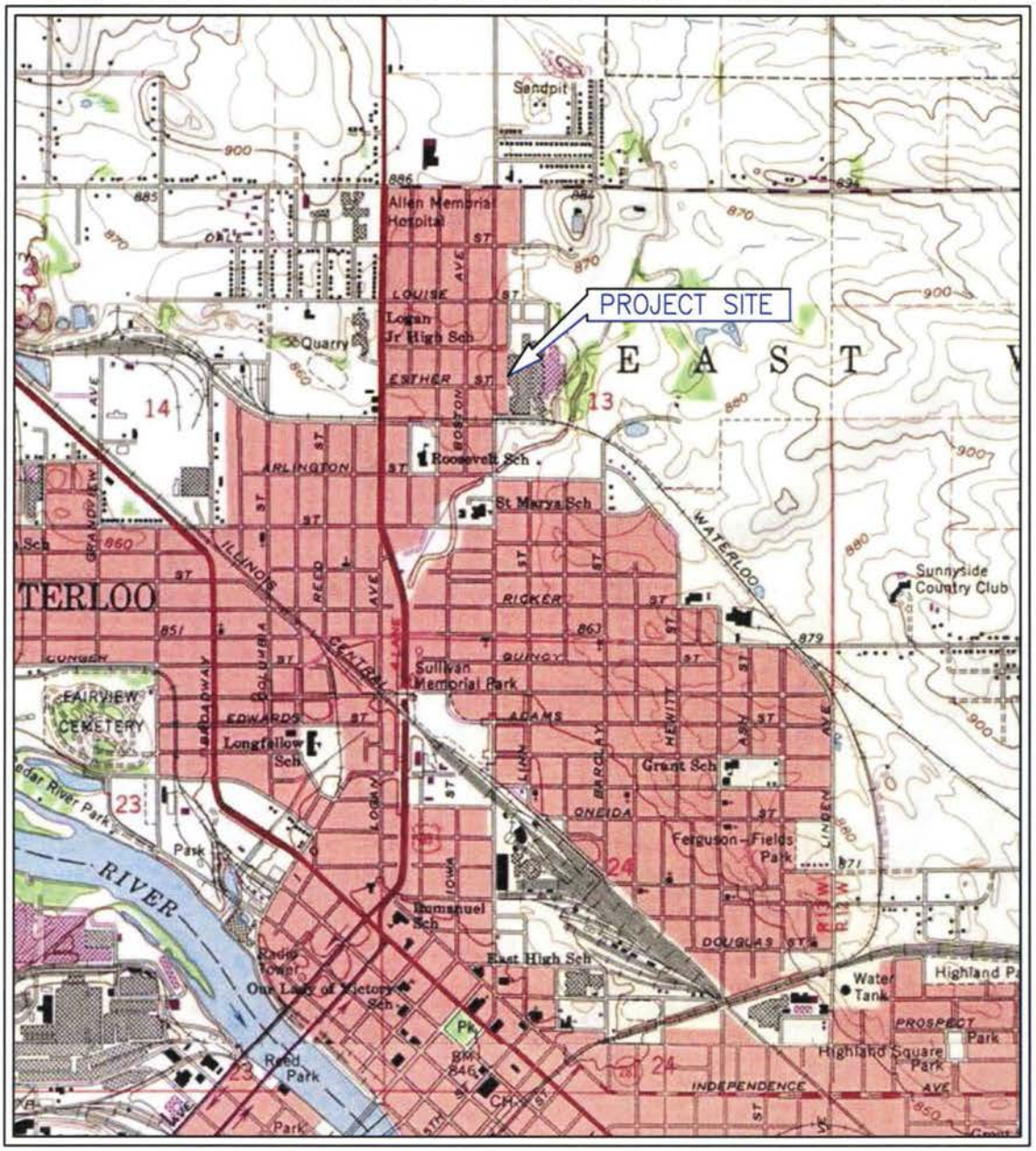
Indoor air samples were collected using 6-liter Summa canisters at Residences No. 73 and 76 with the blind duplicate being collected at Residence No. 76. The Summa canisters were submitted for analysis of PCE, TCE, vinyl chloride, trans-1,2-dichloroethene (trans-DCE), cis-1,2-dichloroethene (cis-DCE), 1,1-dichloroethene, 1,1-dichloroethane, 1,1,1-trichloroethane (TCA), and 1,1,2- trichloroethane, using EPA Method TO-15.

Laboratory procedures were conducted by TestAmerica of Knoxville, Tennessee. TestAmerica is NELAC accredited for the laboratory methods referenced above. The laboratory QAM is on file with the USEPA. A copy of the SOPs for the specified method was included as Appendix F of the VIC Work Plan. The TestAmerica data is reported in accordance with the QAM and SOP. Results of indoor air monitoring activities conducted over this current period are summarized in Table 1, Appendix B. Historical summaries of air results at Residences No. 73 and 76 are provided on Tables 2 and 3 (Appendix B), respectively. Copies of analytical reports for samples collected over this period are provided in Appendix C.

The analytical results for the air sample collected at Residence No. 73 indicated one exceedence of applicable thresholds established in the VIC Work Plan and subsequent USEPA-approved modifications (see Table 2 of Appendix B). The threshold exceedence was for TCE with a reported result of 1.2 ug/m^3 which was the same concentration as was reported in March 2012 prior to additional work to seal potential intrusion pathways in the basement. Following sealing of a steel plate in the basement, TCE air concentrations declined. As indicated elsewhere in this report, this house underwent repair/cleaning work following a sewer backup. The extent of the clean-up work and potential modifications/repairs should be understood prior to making a decision on if a vapor mitigation system is needed at this residence. The intent of this additional work would be to evaluate if the TCE exceedence is from chemical artifacts introduced during cleaning/rehabilitation, a potential preferential pathway as a result of the rehabilitation, or vapor intrusion that warrants a mitigation system.

The analytical results for the air sample collected at Residence No. 76 had reported concentrations that were below applicable thresholds established in the VIC Work Plan and subsequent USEPA-approved modifications (see Table 3 of Appendix B). As such, the installation of a vapor mitigation system at this residence is not required based on analytical results covered under this report. Since a sub-slab sample at this location exceeded sub-slab screening levels, routine monitoring will continue in accordance with the approved VIC Report. The next scheduled monitoring event will occur during the 3rd quarter of 2013.

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24,000

KILOMETERS 1 .5 0 1 2
METERS 1000 0 1000 2000
MILES 1 .5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

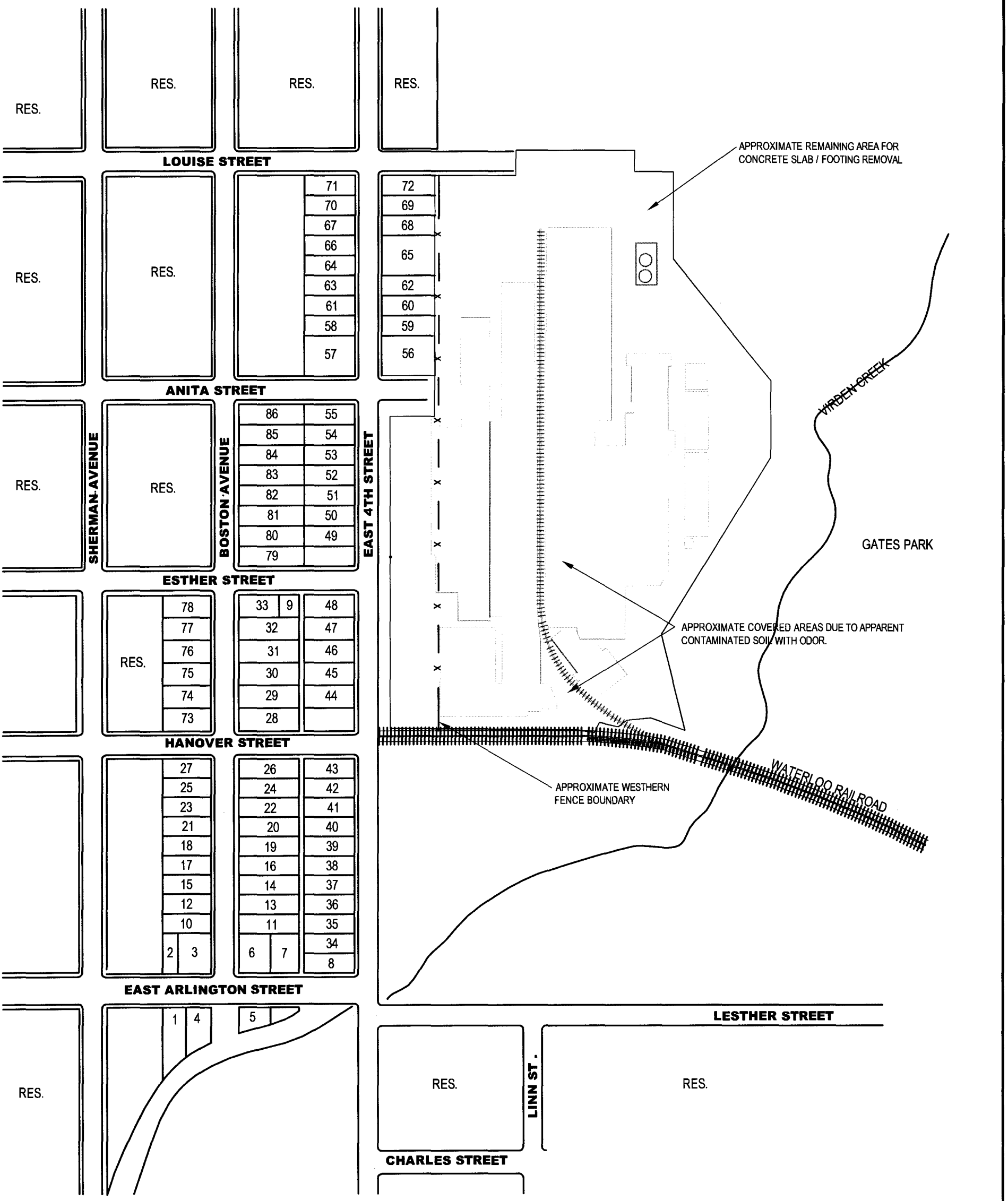
N

WATERLOO NORTH, IOWA
QUADRANGLE
1972
7.5 MINUTE SERIES (TOPOGRAPHIC)

Project Mngr: MEH	Project No. 07122020	Terracon Consulting Engineers and Scientists	SITE LOCATION TOPOGRAPHIC MAP
Drawn By: PAI	Scale: AS SHOWN	15080 A CIRCLE OMAHA, NE 68144	VIIM QUARTERLY REPORT NO. 8
Checked By: MEH	File No. 07122020C06	PH. (402) 330-2202 FAX. (402) 330-7606	FORMER CHAMBERLAIN MANUFACTURING FACILITY
Approved By: DMS	Date: 7/29/13		550 ESTHER STREET
			WATERLOO IOWA

EXHIBIT 1

P:\2010\07107020\PROJECT DOCUMENTS (Reports-Letters-Drafts To Clients)\Diagrams-Drawings-Figures\DWGS\07107020C06.dwg Layout: TOPO 7/29/2013 3:24 PM



NOTE: SITE FEATURES SHOWN IN LIGHT GRAY AS THE SITE IS CURRENTLY BEING DEMOLISHED BY THE CITY OF WATERLOO. THE BUILDINGS, RAIL AND A PORTION OF THE CONCRETE HAVE BEEN REMOVED AS OF APRIL 30, 2013.

LEGEND

40	RESIDENCES INCLUDED IN STUDY AREA WITH ID NUMBER

REV.	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists
15080 A CIRCLE OMAHA, NE 68144
PH. (402) 330-2202 FAX. (402) 330-7606

SITE PLAN

VIIM QUARTERLY REPORT NO. 8

FORMER CHAMBERLAIN MANUFACTURING FACILITY

550 ESTHER STREET

WATERLOO IOWA

EXHIBIT

PROJECT MGR:	MEH
DRAWN BY:	PAI
APPVD. BY:	DMS
SCALE:	AS SHOWN
DATE:	7/29/13
PROJECT NO.	07122020
FILE NAME:	07122020C06
SHEET NO.:	2 OF 2

TABLE 1
INDOOR AIR ANALYTICAL RESULTS
2nd Quarter 2013
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 8
CHAMBERLAIN MANUFACTURING

	Sample ID	IA-B-76-3	IA-Duplicate (IA-B-76-3)	IA-B-73-4	Reporting Limit	Analytical Method Detection Limit	Indoor Air Screening Level [2]
	Date	6/27/2013	6/27/2013	6/27/2013			
Analyte	Units						
Tetrachloroethene	µg/m^3	0.35 J	1.20	0.67	0.54	0.11	9.4 [3]
Trichloroethene	µg/m^3	0.17 J	0.15 J	1.20	0.21	0.075	0.43 [4]
Vinyl chloride	µg/m^3	<0.20	<0.20	<0.20	0.2 [1]	0.074	0.165
trans-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	0.32	0.079	63
cis-1,2-Dichloroethene	µg/m^3	<0.32	<0.32	<0.32	0.32	0.095	63
1,1-Dichloroethene	µg/m^3	<0.32	<0.32	0.064 J	0.32	0.056/0.052	210
1,1-Dichloroethane	µg/m^3	<0.32	<0.32	<0.32	0.32	0.04	1.5
1,1,1-Trichloroethane	µg/m^3	0.082 J	<0.44	0.59	0.44	0.065	5200
1,1,2-Trichloroethane	µg/m^3	<0.44	<0.44	<0.44	0.44 [1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
[2] - Per USEPA approved VIC Work Plan
[3] - Revised Action Threshold for PCE per USEPA e-mail dated February 17, 2012
[4] - Revised per USEPA's letter dated October 27, 2011 and as an accommodation to USEPA without waiver of Chamberlain's concerns expressed in its email to USEPA dated November 14, 2011.

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
The numeric value following the sample type identify the Residence ID Number

TABLE 2
INDOOR AIR ANALYTICAL RESULTS - Residence No. 73
2nd Quarter 2013
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 8
CHAMBERLAIN MANUFACTURING

		Subslab	Indoor	Indoor	Indoor	Indoor	Indoor	Indoor			
	Sample ID	SS-73	IA-B-73	IA-B-73 Duplicate	IA-B-73-2	IA-B-73-3	IA-B-73-3 (dup)	IA-B-73-4	**Reporting Limit**	**Analytical Method Detection Limit**	**Indoor Air Screening Level [2]**
	Date	12/14/2011	3/23/2012	3/23/2012	6/26/2012	9/21/2012	9/21/2012	6/27/2013			
Analyte	**Units**										
Tetrachloroethene	ug/m^3	2.9	0.26	0.34	0.28	<0.54	0.17 J	0.67	0.54	0.11	9.4 [3]
Trichloroethene	ug/m^3	85	1.2	1.2	0.51	0.23	0.59	1.20	0.21	0.075	0.43 [4]
Vinyl chloride	ug/m^3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	0.2 [1]	0.074	0.165
trans-1,2-Dichloroethene	ug/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.079	63
cis-1,2-Dichloroethene	ug/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.095	63
1,1-Dichloroethene	ug/m^3	<0.32	<0.32	<0.32	<0.32	0.066 J	<0.32	0.064 J	0.32	0.052/0.056	210
1,1-Dichloroethane	ug/m^3	0.080 J	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.04	1.5
1,1,1-Trichloroethane	ug/m^3	8.3	0.11	0.11	0.12	0.10 J	0.11 J	0.59	0.44	0.065	5200
1,1,2-Trichloroethane	ug/m^3	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	0.44 [1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
[2] - Per USEPA approved VIC Work Plan
[3] - Revised Action Threshold for PCE per USEPA e-mail dated February 17, 2012
[4] - Revised per USEPA's letter dated October 27, 2011 and as an accommodation to USEPA without waiver of Chamberlain's concerns expressed in its email to USEPA dated November 14, 2011.

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
The numeric value following the sample type identify the Residence ID Number

TABLE 3
INDOOR AIR ANALYTICAL RESULTS - Residence No. 76
2nd Quarter 2013
VAPOR INTRUSION INTERIM MEASURES QUARTERLY REPORT NO. 8
CHAMBERLAIN MANUFACTURING

		Subslab	Indoor	Indoor	Indoor	Indoor	Reporting Limit	Analytical Method Detection Limit	Indoor Air Screening Level [2]
	Sample ID	SS-76	IA-B-76	IA-B-76	IA-B-76-3	IA-Duplicate (IA-B-76-3)			
	Date	12/14/2011	3/23/2012	8/24/2012	6/27/2013	6/27/2013			
Analyte	**Units**								
Tetrachloroethene	ug/m^3	2.8	<0.54	0.17 J	0.35 J	1.20	0.54	0.11	9.4 [3]
Trichloroethene	ug/m^3	7.1	<0.21	0.13 J	0.17 J	0.15 J	0.21	0.075	0.43 [4]
Vinyl chloride	ug/m^3	<0.2	<0.2	<0.2	<0.20	<0.20	0.2 [1]	0.074	0.165
trans-1,2-Dichloroethene	ug/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.079	63
cis-1,2-Dichloroethene	ug/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.095	63
1,1-Dichloroethene	ug/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.052/0.056	210
1,1-Dichloroethane	ug/m^3	<0.32	<0.32	<0.32	<0.32	<0.32	0.32	0.04	1.5
1,1,1-Trichloroethane	ug/m^3	3.4	0.17	0.26 J	0.082 J	<0.44	0.44	0.065	5200
1,1,2-Trichloroethane	ug/m^3	<0.44	<0.44	<0.44	<0.44	<0.44	0.44 [1]	0.11	0.15

NOTES: µg/m3 - micrograms per cubic meter
ppm - parts per million
J - The contaminant is present at a concentration greater than the Analytical Method Detection Limit, but less than the Reporting Limit.
[1] - Indoor Air Screening Level is less than Reporting Limit. The USEPA has approved the use of the Reporting Limit as the screening level for this site due to the technical inability to accurately quantify the detection of these compounds at the current USEPA screening level.
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[4] - Revised per USEPA's letter dated October 27, 2011 and as an accommodation to USEPA without waiver of Chamberlain's concerns expressed in its email to USEPA dated November 14, 2011.

SAMPLE ID NOMENCLATURE: First 2 letters identify sample type: SS - Sub-Slab, IA - Indoor Air, AA - Ambient Air, and EB - Equipment Blank
The numeric value following the sample type identify the Residence ID Number

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613
Tel: (319)277-2401

TestAmerica Job ID: 310-11235-1
Client Project/Site: Air - Chamberlain Mfg.

For:
Terracon Consulting Eng & Scientists
15080 A Circle
Omaha, Nebraska 68144

Attn: Mr. Mike Hagemeister

Authorized for release by:
7/16/2013 10:03:05 AM

Brian Graettinger, Project Manager I
brian.graettinger@testamericainc.com

Job ID: 310-11235-1

Laboratory: TestAmerica Cedar Falls

Narrative

Job Narrative
310-11235-1

Comments
No additional comments.

Receipt
The samples were received on 6/27/2013 1:55 PM; the samples arrived in good condition.

No analytical or quality issues were noted.

Sample Summary

Client: Terracon Consulting Eng & Scientists
Project/Site: Air - Chamberlain Mfg.

TestAmerica Job ID: 310-11235-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-11235-1	IA-B-76-3	Air	06/27/13 09:01	06/27/13 13:55
310-11235-2	IA-B-73-4	Air	06/27/13 09:46	06/27/13 13:55
310-11235-3	IA-Duplicate	Air	06/27/13 09:02	06/27/13 13:55

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

ANALYTICAL REPORT

Terracon

Lot #: H3G010414

Brian Graettinger

TestAmerica Cedar Falls
704 Enterprise Drive
Cedar Falls, IA 50613-0625

TESTAMERICA LABORATORIES, INC.

Jamie A. McKinney
Project Manager

July 9, 2013

ANALYTICAL METHODS SUMMARY

H3G010414

PARAMETER	ANALYTICAL METHOD
Volatile Organics by TO15	EPA-2 TO-15

References:

EPA-2 "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air", EPA-625/R-96/010b, January 1999.

SAMPLE SUMMARY

H3G010414

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
MO81G	001	IA-B-76-3	06/27/13	09:01
MO81J	002	IA-B-73-4	06/27/13	09:46
MO81K	003	IA-DUPLICATE	06/27/13	09:02

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

PROJECT NARRATIVE
H3G010414

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

The "Relinquished by" field on the chain of custody documentation did not contain a signature.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

EPA methods TO-14A and TO-15 specify the use of humidified "zero air" as the blank reagent for canister cleaning, instrument calibration and sample analysis. Ultra-high purity humidified nitrogen from a cryogenic reservoir is used in place of "zero air" by TestAmerica Knoxville.

CERTIFICATION SUMMARY

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Knoxville	ACLASS	DoD ELAP		ADE-1434
TestAmerica Knoxville	Arkansas	State Program	6	88-0688
TestAmerica Knoxville	California	State Program	9	2423
TestAmerica Knoxville	Colorado	State Program	8	N/A
TestAmerica Knoxville	Connecticut	State Program	1	PH-0223
TestAmerica Knoxville	Florida	NELAC	4	E87177
TestAmerica Knoxville	Georgia	State Program	4	906
TestAmerica Knoxville	Hawaii	State Program	9	N/A
TestAmerica Knoxville	Indiana	State Program	5	C-TN-02
TestAmerica Knoxville	Iowa	State Program	7	375
TestAmerica Knoxville	Kansas	NELAC	7	E-10349
TestAmerica Knoxville	Kentucky	State Program	4	90101
TestAmerica Knoxville	Louisiana	NELAC	6	LA110001
TestAmerica Knoxville	Louisiana	NELAC	6	83979
TestAmerica Knoxville	Maryland	State Program	3	277
TestAmerica Knoxville	Michigan	State Program	5	9933
TestAmerica Knoxville	Minnesota	NELAC	5	047-999-429
TestAmerica Knoxville	Nevada	State Program	9	TN00009
TestAmerica Knoxville	New Jersey	NELAC	2	TN001
TestAmerica Knoxville	New York	NELAC	2	10781
TestAmerica Knoxville	North Carolina	North Carolina DENR	4	64
TestAmerica Knoxville	North Carolina	North Carolina PHL	4	21705
TestAmerica Knoxville	Ohio	OVAP	5	CL0059
TestAmerica Knoxville	Oklahoma	State Program	6	9415
TestAmerica Knoxville	Pennsylvania	NELAC	3	68-00576
TestAmerica Knoxville	South Carolina	State Program	4	84001
TestAmerica Knoxville	Tennessee	State Program	4	2014
TestAmerica Knoxville	Texas	NELAC	6	T104704380-TX
TestAmerica Knoxville	USDA	USDA		P330-11-00035
TestAmerica Knoxville	Utah	NELAC	8	QUAN3
TestAmerica Knoxville	Virginia	State Program	3	165
TestAmerica Knoxville	Washington	State Program	10	C593
TestAmerica Knoxville	West Virginia	West Virginia DEP	3	345
TestAmerica Knoxville	West Virginia	West Virginia DHHR (DW)	3	9955C
TestAmerica Knoxville	Wisconsin	State Program	5	998044300

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

TestAmerica Cedar Falls

Client Sample ID: IA-B-76-3

GC/MS Volatiles

Lot-Sample #	H3G010414 - 001	**Work Order #**	M081G1AA	**Matrix.....:**	AIR
Date Sampled...:	06/27/2013	**Date Received..:**	07/01/2013		
Prep Date.....:	07/02/2013	**Analysis Date...**	07/03/2013		
Prep Batch #.....:	3184036				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.052**	**0.080**	**0.016**	**0.35 J**	**0.54**	**0.11**
1,1,1-Trichloroethane	**0.015**	**0.080**	**0.012**	**0.082 J**	**0.44**	**0.065**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.031**	**0.040**	**0.014**	**0.17 J**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.014	ND	0.32	0.056
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	99	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: IA-B-73-4

GC/MS Volatiles

Lot-Sample #	H3G010414 - 002	**Work Order #**	M081J1AA	**Matrix.....:**	AIR
Date Sampled...:	06/27/2013	**Date Received..:**	07/01/2013		
Prep Date.....:	07/02/2013	**Analysis Date...**	07/03/2013		
Prep Batch #.....:	3184036				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.099**	**0.080**	**0.016**	**0.67**	**0.54**	**0.11**
1,1,1-Trichloroethane	**0.11**	**0.080**	**0.012**	**0.59**	**0.44**	**0.065**
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.22**	**0.040**	**0.014**	**1.2**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	**0.016**	**0.080**	**0.014**	**0.064 J**	**0.32**	**0.056**
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	104	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: IA-DUPLICATE

GC/MS Volatiles

Lot-Sample #	H3G010414 - 003	**Work Order #**	M081K1AA	**Matrix.....:**	AIR
Date Sampled...:	06/27/2013	**Date Received..:**	07/01/2013		
Prep Date.....:	07/02/2013	**Analysis Date...**	07/03/2013		
Prep Batch #.....:	3184036				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	**0.18**	**0.080**	**0.016**	**1.2**	**0.54**	**0.11**
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	**0.028**	**0.040**	**0.014**	**0.15 J**	**0.21**	**0.075**
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.014	ND	0.32	0.056
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	97	60 - 140

Qualifiers

J Estimated result. Result is less than RL.

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: INTRA-LAB BLANK

GC/MS Volatiles

Lot-Sample #	H3G030000 - 036B	**Work Order #**	M09121AA	**Matrix.....:**	AIR
	06/27/2013	**Date Received..:**	07/01/2013		
Prep Date.....:	07/02/2013	**Analysis Date...**	07/02/2013		
Prep Batch #.....:	3184036				
Dilution Factor.:	1	**Method.....:**	TO-15		

PARAMETER	RESULTS (ppb(v/v))	REPORTING LIMIT (ppb(v/v))	MDL (ppb(v/v))	RESULTS (ug/m3)	REPORTING LIMIT (ug/m3)	MDL (ug/m3)
Tetrachloroethene	ND	0.080	0.016	ND	0.54	0.11
1,1,1-Trichloroethane	ND	0.080	0.012	ND	0.44	0.065
1,1,2-Trichloroethane	ND	0.080	0.021	ND	0.44	0.11
Trichloroethene	ND	0.040	0.014	ND	0.21	0.075
Vinyl chloride	ND	0.080	0.029	ND	0.20	0.074
1,1-Dichloroethane	ND	0.080	0.010	ND	0.32	0.040
1,1-Dichloroethene	ND	0.080	0.014	ND	0.32	0.056
cis-1,2-Dichloroethene	ND	0.080	0.024	ND	0.32	0.095
trans-1,2-Dichloroethene	ND	0.080	0.020	ND	0.32	0.079

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	97	60 - 140

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

TestAmerica Cedar Falls

Client Sample ID: CHECK SAMPLE

GC/MS Volatiles

Lot-Sample # H3G030000 - 036C **Work Order #** M09121AC **Matrix.....:** AIR

	06/27/2013	**Date Received..:**	07/01/2013
Prep Date.....:	07/02/2013	**Analysis Date...**	07/02/2013
Prep Batch #.....:	3184036		
Dilution Factor.:	1	**Method.....:**	TO-15

PARAMETER	SPIKE AMOUNT (ppb(v/v))	MEASURED AMOUNT (ppb(v/v))	SPIKE AMOUNT (ug/m3)	MEASURED AMOUNT (ug/m3)	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloroethene	5.00	5.63	34	38	113	70 - 130
1,1,1-Trichloroethane	5.00	5.48	27	30	110	70 - 130
1,1,2-Trichloroethane	5.00	5.40	27	29	108	70 - 130
Trichloroethene	5.00	5.25	27	28	105	70 - 130
Vinyl chloride	5.00	5.16	13	13	103	70 - 130
1,1-Dichloroethane	5.00	5.38	20	22	108	70 - 130
1,1-Dichloroethene	5.00	5.05	20	20	101	70 - 130
cis-1,2-Dichloroethene	5.00	4.96	20	20	99	70 - 130
trans-1,2-Dichloroethene	5.00	4.93	20	20	99	70 - 130

SURROGATE	PERCENT RECOVERY	LABORATORY CONTROL LIMITS (%)
4-Bromofluorobenzene	98	60 - 140

The 'Result' in ug/m3 is calculated using the following equation: Amount Found(before rounding)*(Molecular Weight/24.45)

The 'Reporting Limit' in ug/m3 is calculated using the following equation: (Reporting Limit(before rounding) * Dilution Factor) * (Molecular Weight/24.45)

TO-14 _rev5MDL.rpt version 5.001 08/20/2010

Test America Knoxville GC/MS Volatiles

Lot ID: H3G010414 **Batch #:** 10441
Matrix: Air **Can #:** 12842
MethCod: 7m
Method: EPA-2 TO-15

Parameter	Result	Reporting Limit	Units
cis-1,2-Dichloroethene	ND	0.080	ppb (v/v)
trans-1,2-Dichloroethene	ND	0.080	ppb (v/v)
Tetrachloroethene	ND	0.080	ppb (v/v)
Trichloroethene	ND	0.040	ppb (v/v)
Vinyl chloride	ND	0.080	ppb (v/v)
1,1-Dichloroethane	ND	0.080	ppb (v/v)
1,1-Dichloroethene	ND	0.080	ppb (v/v)
1,1,1-Trichloroethane	ND	0.080	ppb (v/v)
1,1,2-Trichloroethane	ND	0.080	ppb (v/v)

TestAmerica Cedar Falls

Test America Knoxville GC/MS Volatiles

Lot ID: H3G010414 **Batch #:** 10405
Matrix: Air **Can #:** 66473 070813
MethCod: 7m
Method: EPA-2 TO-15

Parameter	Result	Reporting Limit	Units
cis-1,2-Dichloroethene	ND	0.080	ppb (v/v)
trans-1,2-Dichloroethene	ND	0.080	ppb (v/v)
Tetrachloroethene	ND	0.080	ppb (v/v)
Trichloroethene	ND	0.040	ppb (v/v)
Vinyl chloride	ND	0.080	ppb (v/v)
1,1-Dichloroethane	ND	0.080	ppb (v/v)
1,1-Dichloroethene	ND	0.080	ppb (v/v)
1,1,1-Trichloroethane	ND	0.080	ppb (v/v)
1,1,2-Trichloroethane	ND	0.080	ppb (v/v)

Test America Knoxville GC/MS Volatiles

Lot ID: H3G010414 **Batch #:** 10409
Matrix: Air **Can #:** 7492
MethCod: 7m
Method: EPA-2 TO-15

Parameter	Result	Reporting Limit	Units
cis-1,2-Dichloroethene	ND	0.080	ppb (v/v)
trans-1,2-Dichloroethene	ND	0.080	ppb (v/v)
Tetrachloroethene	ND	0.080	ppb (v/v)
Trichloroethene	ND	0.040	ppb (v/v)
Vinyl chloride	ND	0.080	ppb (v/v)
1,1-Dichloroethane	ND	0.080	ppb (v/v)
1,1-Dichloroethene	ND	0.080	ppb (v/v)
1,1,1-Trichloroethane	ND	0.080	ppb (v/v)
1,1,2-Trichloroethane	ND	0.080	ppb (v/v)

1436010414 Custody seals intact. Fed Ex (96124122) 2560900 40364313

TAL Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
phone 865-291-3000 fax 865-584-4315

Canister Samples Chain of Custody Record

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information	Project Manager: Mike Hagemeister	Sampled By: Rob Bergman	1 of 1 COCs
Company: Terracon	Phone: 402-330-2202		
Address: 6612 Chancellor Dr. Ste 102	Site Contact:		
City/State/Zip Cedar Falls, IA 50613	TAL Contact:		
Phone: 319-277-4016			
FAX:			
Project Name: Chamberlain Mfg.	Analysis Turnaround Time		
Site/location: Waterloo, IA	(Standard (Specify)		
PO #	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-B-76-3	6-26-13 6-27-13	0913	0901	-27.5	-1.0	K119	12842	X							X				
IA-B-73-4	6-26-13 6-27-13	0937	0946	-27.5	-3.5	K464	6647	X							X				
IA-Duplicate	6-26-13 6-27-13	0910	0902	-28.0	0.0	K480	7492	X							X				

Sampled by: Rob Bergman

	Temperature (Fahrenheit)		
	Interior	Ambient	
Start			
Stop			

	Pressure (inches of Hg)		
	Interior	Ambient	
Start			
Stop			

CUSTODY SEALS INTACT
RECEIVED AT AMBIENT TEMP
AND 7-1-13
VIA FEDX # 2560900 40364313

3 CANS / 3 FLOWS

Special Instructions/QC Requirements & Comments:

email results to dclearyeterracon.com and mehagemeister@terracon.com

Canisters Shipped by: Dropped @ TestAmerica	Date/Time: 6/27/13 1:55	Canisters Received by:	
Samples Relinquished by: Rob Bergman	Date/Time: 6/27/13 1:55	Received by: [signature] 7-1-13 10:30	
Relinquished by:	Date/Time:	Received by: Connie Holst 6-27-13 1:55	

TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Lot Number: HBG010414

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **1a** Do not match COC ☐ **1b** Incomplete information ☐ **1c** Marking smeared ☐ **1d** Label torn ☐ **1e** No label ☐ **1f** COC not received ☐ **1g** Other:	14A
2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)			✓	☐ **2a** Temp Blank = _____ ☐ **2b** Cooler Temp = _____ ☐ **2c** Cooling initiated for recently collected samples, ice present.	
3. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **3a** Sample preservative =	
4. Were custody seals present/intact on cooler and/or containers?	✓			☐ **4a** Not present ☐ **4b** Not intact ☐ **4c** Other:	
5. Were all of the samples listed on the COC received?	✓			☐ **5a** Samples received-not on COC ☐ **5b** Samples not received-on COC	
6. Were all of the sample containers received intact?	✓			☐ **6a** Leaking ☐ **6b** Broken	
7. Were VOA samples received without headspace?		✓		☐ **7a** Headspace (VOA only)	
8. Were samples received in appropriate containers?	✓			☐ **8a** Improper container	
9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)			✓	☐ **9a** Could not be determined due to matrix interference	
10. Were samples received within holding time?	✓			☐ **10a** Holding time expired	
11. For rad samples, was sample activity info. provided?			✓	☐ Incomplete information	
12. For 1613B water samples is pH<9?			✓	If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____	
13. Are the shipping containers intact?	✓			☐ **13a** Leaking ☐ **13b** Other:	
14. Was COC relinquished? (Signed/Dated/Timed) DD 7-1-13	X	✓		☐ **14a** Not relinquished	
15. Are tests/parameters listed for each sample?	✓			☐ **15a** Incomplete information	
16. Is the matrix of the samples noted?	✓			☐ **15a** Incomplete information	
17. Is the date/time of sample collection noted?	✓			☐ **15a** Incomplete information	
18. Is the client and project name/# identified?	✓			☐ **15a** Incomplete information	
19. Was the sampler identified on the COC?	✓			☐ **19a** Other	

Quote #: 87209 PM Instructions: NA

Sample Receiving Associate: [signature] Date: 7-1-13 DD 7-1-13

QA026R24.doc, 060413

Test America - Knoxville ---- Air Canister Dilution Log

Lot Number: *H3G010414*

Initial Can Pressure							Subsequent Dilutions											
Analyst/Date	Can or Tedlar bag prep Time	Baro ID B2 Pbarr (in)	Sample ID	Can #	Pres. upon receipt (-in or + psig)	Adj. Initial Pres. (-in or + psig)	Analyst/Date	I / S	Baro ID___ Pbarr (in)	Initial Pres. Pi (in)	Final Pres. Pf (psig)	First InCan Final Pres. Pf (psig)	Second In-can Final Pres. Pf (psig)	Third InCan Final Pres. Pf (psig)	Serial Dilution Can #	Vol (mL)	Final Pres. Pf (psig)	Comments
AHS 7/1/13	1740	28.66	M081G	12842 ✓	-1.8	—												10441
			M081J	6647 ✓	-4.3	—												10405
			M081K	7492 ✓	0	—												10409

Knoxville, TN 37921
phone 865-291-3000 fax 865-584-4315

TestAmerica assumes no liability with respect to the collection and shipment of these samples.

THE LEADER IN ENVIRONMENTAL TESTING

Client Contact Information	Project Manager: Mike Hagemeister	Sampled By: Rob Bergman	1 of 1 COCs
Company: Terracon	Phone: 402-330-2202		
Address: 6612 Chancellor Dr. Ste 102	Site Contact:		
City/State/Zip Cedar Falls, IA 50613	TAL Contact:		
Phone: 319-277-4016			
FAX:			
Project Name: Chamberlain Mfg.	Analysis Turnaround Time		
Site/location: Waterloo, IA	(Standard) (Specify)		
PO #	Rush (Specify)		

Sample Identification	Sample Date(s)	Time Start	Time Stop	Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID	TO-15	TO-14A	EPA 3C	EPA 25C	ASTM D-1946	Other (Please specify in notes section)	Sample Type	Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (Please specify in notes section)
IA-B-76-3	6-26-13 6-27-13	0913	0901	-27.5	-1.0	K119	12842	X							X				
IA-B-73-4	6-26-13 6-27-13	0937	0946	-27.5	-3.5	K464	6647	X							X				
IA-Duplicate	6-26-13 6-27-13	0910	0902	-28.0	0.0	K480	7492	X							X				

Sampled by: Rob Bergman

Temperature (Fahrenheit)	Interior	Ambient	
Start			
Stop			

Pressure (inches of Hg)	Interior	Ambient	
Start			
Stop			

Special Instructions/QC Requirements & Comments:

email results to dclearyeterracon.com and mehagemeister@terracon.com

Canisters Shipped by: Dropped @ TestAmerica	Date/Time: 6/27/13 1:55	Canisters Received by:
Samples Relinquished by: Rob Bergman	Date/Time: 6/27/13 1:55	Received by:
Relinquished by:	Date/Time:	Received by: Connie Holst 6-27-13 1:55

310-11235 Chain of Custody

Page 21 of 21

7/16/2013